Space Weather Forecast

Issued on Friday 13 December 2024 at 01:10 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate Solar Activity likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate activity, with two Moderate class flares observed. There are five sunspot regions on the disc, with these two flares from one of the smaller of the groups on the disc. This is hard to analyse due to its location and small size, but perhaps has a very weak mixed magnetic polarity spot on its trailer. The most notable region is in the southwest, and has seen notable growth with its area, to become a moderately sized region with mixed polarities within its main spot. However, any activity from this region has been limited to Common-class flares. A further sized region is located in the north-centre disc, but this has shown signs of simplification and maturation, with a separation of its two main spots.

There are no Earth-directed coronal mass ejections (CMEs). However observation imagery has been limited, lowering confidence. This includes for both of the Moderate class flares, with no current imagery available to assess to see if any CME occurred.

Solar Wind / Geomagnetic Activity: Solar winds showed an ongoing slow wind regime. Solar wind speed were at Background 330-370 km/s. Interplanetary Magnetic Field (IMF) was Weak, with the north-south component, also Weak and variable in direction. Geomagnetic activity was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is likely, with isolated M-class flares. There is a slight chance of X-class flares.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Slow wind conditions are expected until CH99's onset, most likely on Day 2 into Day 3 (14-15 Dec). Geomagnetic activity is expected to start mostly Quiet as a result, then rising to give a spell of Unsettled to Active with a Slight Chance of G1 Minor Storm intervals. Activity easing later Day 3 and Day 4 (15-16 Dec), to be Quiet with isolated Unsettled intervals.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 370 900 0100 Email: enquiries@metoffice.gov.uk

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Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background with no solar radiation storms occurring. Although there is a slight chance of these occurring, given any notable flares

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	10	20	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	70	65	60	60
Very Active	R3-R5 (X Class)	No	10	10	10	10

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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